

REMARKS

Reconsideration of the application is requested in view of the above amendments and the following remarks. Claims 17 and 19-22 have been canceled without prejudice or disclaimer. Claim 18 has been amended. Claims 32 and 33 are added. No new matter has been added.

§ 102 Rejections

Claims 4, 13, 14, 18, and 25-26 were rejected under 35 U.S.C. § 102(b) as being anticipated by Zuev (US 6,223,827). Applicants respectfully traverse this rejection.

Claim 4 recites control means including means for applying the pressure of the stored gas to pressurise the liquid extinguishing agent whereby the reducing applied pressure correspondingly reduces the mass flow rate of the liquid extinguishing agent so as to control the ratio of the mass flow rate of the liquid extinguishing agent to the mass flow rate of the pressurised gas towards such a value as to tend to produce a constant droplet size distribution in and for substantially the duration of the discharge.

Similarly, claim 18 recites controlling of said ratio to produce said constant droplet size distribution in and for substantially the duration of the discharge is achieved at least partially by applying the pressure of the stored gas to pressurise the liquid extinguishing agent whereby the reducing applied pressure correspondingly reduces the mass flow rate of the liquid extinguishing agent as the mass flow rate of the gas undergoes said reduction thereof.

As noted in the Office Action, the regulator valve 3 in Zuev applies a constant gas pressure of 6 Bar to the liquid in container 1 throughout the duration of the discharge. See Office Action, page 6 (“the examiner is considering the time it will take for the gas pressure to drop from 300 Bar to less than 6 Bar to be substantially the duration of discharge”); and Zuev, column 3, lines 7-13. In a similar manner, the pressure of gas that is applied to the nozzle 4 from the container 2 through the pipe 6 will also be maintained at a constant gas pressure of about 6 Bar by virtue of the regulator valve 3. Accordingly, in Zuev, the mass flow rate of the liquid fed to the nozzle 4 by the pipe 5, and the mass flow rate of the gas fed to the nozzle 4 via the pipe 6, both remain constant. Consequently, the ratio of these mass flow rates will also remain constant.

However, claims 4 and 18 require a reduction in the flow rate. For example, claims 4 and 18 require that the ratio of the mass flow rate of the liquid and the mass flow rate of the gas are

controlled, and this tends to produce a constant droplet size distribution, but these effects are achieved while the mass flow rate of the gas and the mass flow rate of the liquid are reducing. This is clearly different from Zuev, because in Zuev the mass flow rate of the liquid and the mass flow rate of the gas remain constant.

Zuev fails to disclose what would happen if the gas pressure falls below 6 Bar. Furthermore, there is no disclosure in Zuev that dropping the gas pressure below 6 Bar could even occur while maintaining the specific outcome recited as the invention in Zuev. As previously discussed, the system disclosed by Zuev is adapted so that the desired preset droplet size is achieved by maintaining constant gas pressure and constant liquid pressure. Therefore, Applicants submit that Zuev fails to disclose every limitation of claims 4 and 18 and the claims that depend from them. Reconsideration and allowance of claims 4 and 18, as well as claims 13, 14, and 25-26 that depend therefrom, are requested.

Claims 3-5, 7, 9, 12-14, 17-19, 21, 22 and 24-26 were rejected under 35 U.S.C. § 102(b) as being anticipated by Dorkin (US 6,478,240). Applicants respectfully traverse this rejection.

Preliminarily, it is noted that claims 17, 19, 21, and 22 are canceled.

Claims 4, 13, 14, 18, 25-26

In Dorkin, the gas pressure regulator 18 fulfills a similar role to the regulator valve 3 of Zuev. Dorkin fails to disclose or suggest a reduction in flow. As such, claims 4 and 18 are allowable for at least the same reasons as those provided above.

In addition and as noted in previous responses, claim 4 recites mixing means for mixing the already-produced mist into a flow of the pressurised gas. The present application discloses a nozzle 13 that produces the “already-produced mist” recited in claim 4:

The nozzle 13 comprises any suitable nozzle for atomizing the water to produce a water mist. Examples of suitable misting nozzles include single or multi-orifices, single or multi-orifice phase direct impingement nozzles, spiral insert nozzles, and rotating disk nozzles. In practice, any standard water mist type nozzles can be used.

Application, page 3, ¶ 3. Claim 4 therefore requires that the mist is produced from the liquid extinguishing agent before the mist is introduced into the flow of the pressurized gas.

In contrast, in Dorkin, the liquid is introduced into a flow of gas in the form of liquid streams which are broken up by sheer forces so as to produce a mist. Accordingly, in Dorkin, mist is not produced before introduction into the gas.

Reconsideration and allowance of claims 4 and 18, as well as claims 13, 14, and 25-26 that depend therefrom, are requested.

Claims 3, 5, 7, 9

Claim 5 recites mixing means for mixing the already-produced mist into a flow of the pressurised gas. Claim 5 is therefore allowable for at least similar reasons to those provided above for claim 4. Reconsideration and allowance of claim 5, as well as claims 3, 7, and 9 that depend therefrom, are requested.

Claim 12

Claim 12 recites mixing means for mixing the already-produced mist into a flow of the pressurised gas. Claim 12 is therefore allowable for at least similar reasons to those provided above for claim 4.

In addition, claim 12 recites means for initiating the flow of the liquid extinguishing agent before initiating the flow of the gas. As noted in previous responses, the devices described in Dorkin are physically incapable of allowing flow of the liquid extinguishing agent to initiate before the flow of the gas. The structure of the Dorkin apparatus, and in particular the fact that the closure member 6 of the water chamber 9 is movable along the rod 7, means that gas will inevitably both be discharged from the gas chamber 8, and enter the mixing chamber 2, before liquid is discharged from the liquid chamber 9.

Further, Dorkin teaches that gas flow starts before liquid flow in the abstract, in lines 6 to 9 of column 3, in lines 17 to 19 of column 5, in lines 64 and 65 of column 7, in lines 47 to 51 of column 8, and in lines 60 to 64 of column 8. Lines 40 to 45 of column 7 of Dorkin, when read literally, are inapposite to the numerous sections noted previously and must be an error, since the apparatus described in Dorkin is simply physically incapable of allowing liquid flow to commence before gas flow.

Reconsideration and allowance of claim 12 are therefore requested.

Claim 24

Claim 24 recites initiating the flow of the liquid extinguishing agent before initiating the flow of the gas. As such, claim 24 is allowable for at least reasons similar to those provided above for claim 12. Reconsideration and allowance are requested.

§103 Rejections

Claims 30 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Dorkin in view of Russwurn (US 6,173,790). Applicants respectfully traverse this rejection. As discussed above, Dorkin fails to disclose or suggest every limitation of claims 4 and 18. Russwurn fails to remedy the deficiencies of Dorkin as it relates to claims 4 and 18. Therefore, claims 30 and 31 are allowable for at least the reason they are dependent upon an allowable base claim. Applicants do not otherwise concede the correctness of this rejection.

New Claims 32-33

Claim 32 is directed to a method for suppressing a fire or an explosion. Claim 32 recites, in part, applying the pressure of the stored gas to pressurise the liquid, whereby the reduced applied pressure correspondingly reduces the mass flow rate of the liquid extinguishing agent. Claim 32 is therefore allowable for at least similar reasons to those provided above for claims 4 and 18.

In addition, claim 32 recites causing the liquid and the gas to flow simultaneously along a common pipe to a nozzle so that a two-phase mixture comprising droplets of the liquid suspended in the gas is discharged from the nozzle. Neither Zuev nor Dorkin discloses or suggests such a limitation, since both use separate pipes to transport the gas and the liquid to the nozzle.

Consideration and allowance of claim 32, as well as claim 33 that depends therefrom, are therefore requested.

Conclusion

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance. If a phone conference would be helpful in resolving any further issues related to this matter, please contact Applicants' attorney listed below at (612) 336.4771.

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